

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An organ manipulation apparatus, including:

at least one suction member having an inner surface and an outer surface, wherein the suction member is configured to exert sufficient suction force on an organ to move the organ when the suction member is placed against the organ, a pressure differential is established between the inner surface and the outer surface, and the suction member is moved;

a support structure; and

a ~~compliant~~ joint coupled between the suction member and the support structure, wherein the support structure and the ~~compliant~~ joint are configured to support the suction member, with the organ supported in a retracted position by the suction member, such that the suction member has freedom to move at least along an axis of the suction member relative to the support structure.

Claims 2-47. (Canceled)

48. (Canceled)

49. (Canceled)

50. (Currently Amended) A method for compliant retraction of a beating heart ~~an organ~~, including the steps of:

(a) retracting the beating heart ~~organ~~ by exerting suction thereon using a suction member coupled to a mounting element, in such a manner that the suction member has freedom to move relative to ~~at least along an axis of said suction member relative to~~ the mounting element in response to normal movement of the beating heart ~~organ~~; and

(b) maintaining the beating heart ~~organ~~ in a retracted position by exerting suction thereon using the suction member while said suction member is coupled to the mounting element, in such a manner that said suction member has freedom to move ~~at least along the axis of said suction member~~ relative to the mounting element, thereby maintaining beating movements of the heart substantially unrestricted.

51. (Currently Amended) The method of claim 50, wherein the suction member is a single

suction cup, ~~the organ is a beating heart~~, and step (b) includes the step of suspending the heart from the suction cup in the retracted position using suction in such a manner that the suction member has freedom to move at least rotationally ~~vertically~~ relative to the mounting element in response to normal beating movement of the heart.

52. (Original) The method of claim 51, wherein the beating heart has an apex, the suction cup is configured to conform to and exert suction on the apex of the beating heart, and step (a) includes the steps of:

affixing the suction cup to the heart at a position of the heart concentric with said apex of the heart;

applying suction to the heart by coupling the suction member to a vacuum source; and
moving the suction member to retract the heart.

Claims 53-55. (Canceled)

56. (Currently Amended) A locking arm having a flexible state and a rigid state for use in an organ manipulator apparatus, the arm comprising:

a cable; and

joint members threaded ~~ball joints threaded~~ along the cable, said joint members configured to interfit with one another and lock with respect to one another while in the rigid state, while being movable with respect to one another while in said flexible state; at least one surface of two interfitting surfaces of two of said joint members having a friction enhancing feature to improve rigidity of locking between the two joint members when in said rigid state ~~each of the ball joints having a convex surface, a concave socket surface, a length, and a diameter, wherein the socket surface is shaped for receiving the convex surface of an adjacent one of the ball joints, and the diameter is greater than the length.~~

Claims 57-67. (Canceled)

68. (New) The organ manipulation apparatus of claim 1, wherein said joint allows said at least one suction member to rotate relative to said support structure.

69. (New) The organ manipulation apparatus of claim 1, wherein said joint allows said at least one suction member to translate relative to said support structure, in directions along a longitudinal axis of at least one of said at least one suction members.

70. (New) The organ manipulation apparatus of claim 1, wherein said at least one suction member has freedom to move, relative to the support structure, in response to normal movement of the organ.

71. (New) The organ manipulation apparatus of claim 70, wherein the organ is a beating heart.

72. (New) The organ manipulation apparatus of claim 71, wherein the beating heart has an apex, and wherein the at least one suction member is configured to conform to, and exert suction on, the apex of the beating heart.

73. (New) The locking arm of claim 56, wherein said friction enhancing feature comprises a textured surface.

74. (New) The locking arm of claim 56, wherein said friction enhancing feature comprises a difference in hardness between compositions of the first and second surfaces.

75. (New) The locking arm of claim 56, wherein said friction enhancing feature comprises a groove in at least one of said first and second surfaces.

76. (New) The locking arm of claim 75, further comprising a material filling said groove, said material being softer than a composition of the surface in which said groove is formed.

77. (New) The locking arm of claim 56, wherein said friction enhancing feature comprises one of said surfaces having a jagged profile comprising circular shoulders.

78. (New) The locking arm of claim 56, wherein said friction enhancing feature comprises at least one of said surfaces having a portion thereof formed of a material having a greater coefficient of friction than a coefficient of friction of a material forming a remainder of said at least one surface.

79. (New) The locking arm of claim 56, wherein said friction enhancing feature comprises at least one of said surfaces having a portion thereof formed of a material having a greater hardness than a hardness of a material forming a remainder of said at least one surface.

80. (New) The locking arm of claim 56, wherein said friction enhancing feature comprises a difference in coefficients of friction between compositions of the first and second surfaces.

81. (New) An organ manipulation apparatus, including:

at least one suction member having an inner surface and an outer surface, wherein the suction member is configured to exert sufficient suction force on a beating heart to move the beating heart when the suction member is placed against the beating heart, a pressure differential is established between the inner surface and the outer surface, and the suction member is moved;

a support structure; and

a joint coupled between the suction member and the support structure, wherein the support structure and the joint are configured to support the suction member, with the beating heart supported in a retracted position by the suction member, such that the suction member has freedom to move relative to the support structure, in response to normal movements of the beating heart.

82. (New) The organ manipulation apparatus of claim 81, wherein said joint allows said at least one suction member to rotate relative to said support structure.

83. (New) The organ manipulation apparatus of claim 81, wherein said joint allows said at least one suction member to translate relative to said support structure, in directions along a longitudinal axis of at least one of said at least one suction members.

84. (New) The organ manipulation apparatus of claim 81, wherein said support structure comprises an elongated arm.

85. (New) The organ manipulation apparatus of claim 84, wherein said elongated arm is a locking arm having a flexible state and a rigid state, said locking arm comprising: a cable; and joint members threaded along the cable, said joint members configured to interfit with one another and lock

with respect to one another while in the rigid state, while being movable with respect to one another while in said flexible state.